# Volunteer Lake Assessment Program Individual Lake Reports

## GLEN LAKE, GOFFSTOWN, NH

**MORPHOMETRIC DATA**

| | | | | | |
|---|---|---|---|---|---|
| **Watershed Area (Ac.):** | 129,480 | **Max. Depth (m):** | 15.8 | **Flushing Rate (yr$^{1}$):** | 80 |
| **Surface Area (Ac.):** | 119 | **Mean Depth (m):** | 5.9 | **P Retention Coef:** | 0.01 |
| **Shore Length (m):** | 4,700 | **Volume (m$^{3}$):** | 2,826,500 | **Elevation (ft):** | 271 |

**TROPHIC CLASSIFICATION**

| Year | Trophic class |
|---|---|
| 1979 | EUTROPHIC |
| 1991 | MESOTROPHIC |

**KNOWN EXOTIC SPECIES**

Variable Milfoil

**The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.**

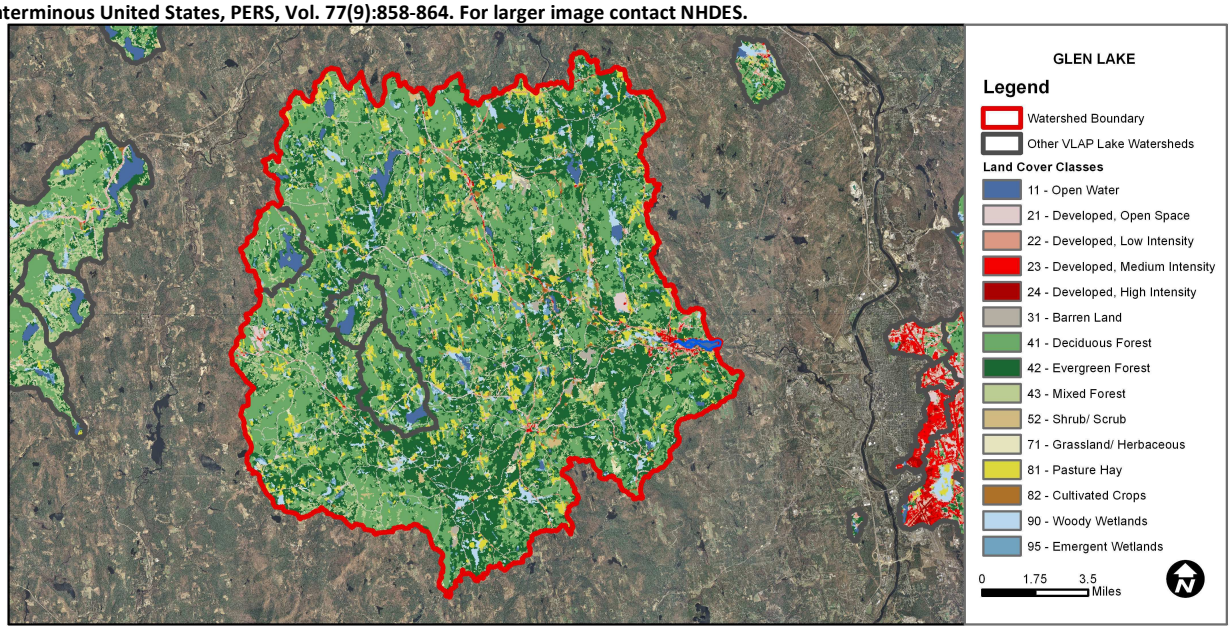
| Designated Use | Parameter | Category | Comments |
|---|---|---|---|
| Aquatic Life | Phosphorus (Total) | Likely Bad | The calculated median is fewer than 5 samples but > indicator and the chlorophyll a indicator is okay. More data needed. |
| | Oxygen, Dissolved | Likely Good | There are < 10 samples with 0 exceedances of criteria. More data needed. |
| | Dissolved oxygen satura | Likely Good | There are < 10 samples with 0 exceedances of criteria. More data needed. |
| | Dissolved oxygen satura | Likely Good | There are < 10 samples with 0 exceedances of criteria. More data needed. |
| | Chlorophyll-a | Likely Bad | The calculated median is fewer than 5 samples but > indicator. More data needed. |
| Primary Contact Recreation | Escherichia coli | Likely Good | There are no geometric means or there are > 2 single samples but those samples are within 75% of the geometric means criteria. More data needed. |
| | Chlorophyll-a | Likely Good | There are < 10 samples with 0 exceedances of indicator. More data needed. |

**BEACH PRIMARY CONTACT ASSESSMENT STATUS**

---

**WATERSHED LAND USE SUMMARY**

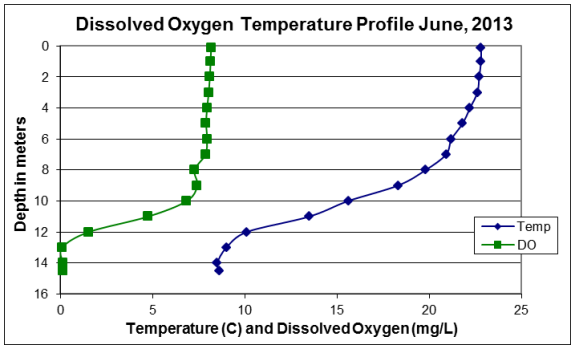
**Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.**

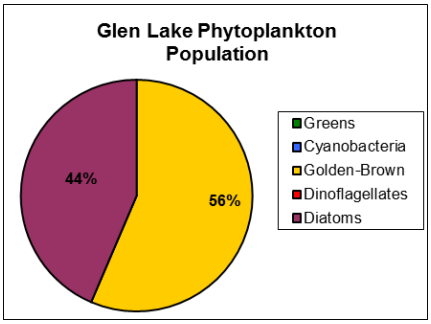


# VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
## GLEN LAKE, GOFFSTOWN, NH
## 2013 DATA SUMMARY

**OBSERVATIONS AND RECOMMENDATIONS** (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels were elevated in June and much greater than the state median. Chlorophyll levels decreased to average concentrations in July. Phytoplankton data indicate that Golden-Brown and Diatom algae were the dominant algae in June.
- **CONDUCTIVITY/CHLORIDE:** Deep spot and Inlet conductivity were slightly elevated and greater than the state median.
- **TOTAL PHOSPHORUS:** Epilimnetic (upper water layer), Metalimnetic (middle water layer) and Hypolimnetic (lower water layer) phosphorus levels were average and approximately equal to the state median in June, but elevated in July.
- **TRANSPARENCY:** Transparency was relatively low in June and July and slightly worse than the state median. Significant storm events occurred prior to sampling and stormwater runoff may have contributed to the low transparency.
- **TURBIDITY:** Epilimnetic and Metalimnetic turbidities were slightly elevated in July potentially due to algal growth. Hypolimnetic turbidity was elevated in June and July potentially due to the release of organic compounds from bottom sediments under anoxic conditions.
- **PH:** pH levels were less than the desirable range of 6.5 – 8.0 units in the Metalimnion and Hypolimnion.
- **DISSOLVED OXYGEN:** Dissolved oxygen levels were depleted to less than 1.0 mg/L in the Hypolimnion. As the summer progresses, Hypolimnetic dissolved oxygen is utilized to decompose organic matter in bottom sediments. When dissolved oxygen levels decrease below 1.0 mg/L, phosphorus and organic compounds typically bound in bottom sediments may be released into the water column. This is likely the cause of the elevated phosphorus and turbidity.
- **RECOMMENDED ACTIONS:** Continue monitoring program to establish baseline water quality and develop historical trends. Several water quality parameters were above average for most NH lakes. Additional monitoring will help determine whether these values are normal for the lake or a result of the above average rainfall and stormwater runoff received in 2013. The increased frequency and intensity of storm events highlights the importance of managing stormwater runoff in the watershed. DES' "Homeowner's Guide to Stormwater Management" is a good resource for lake residents.




**NH Median Values:** Median values for specific parameters generated from historic lake monitoring data.
**Alkalinity:** 4.9 mg/L
**Chlorophyll-a:** 4.58 mg/m$^3$
**Conductivity:** 40.0 uS/cm
**Chloride:** 4 mg/L
**Total Phosphorus:** 12 ug/L
**Transparency:** 3.2 m
**pH:** 6.6

**NH Water Quality Standards:** Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
**Chloride:** < 230 mg/L (chronic)
**E. coli:** > 88 cts/100 mL – public beach
**E. coli:** > 406 cts/100 mL – surface waters
**Turbidity:** > 10 NTU above natural level
**pH:** 6.5-8.0 (unless naturally occurring)

Table 1. 2013 Average Water Quality Data for GLEN LAKE

| Station Name | Alk. | Chlor-a | Cond. | Total P | Trans. | | Turb. | pH |
|---|---|---|---|---|---|---|---|---|
| | mg/l | ug/l | uS/cm | ug/l | m | | ntu | |
| | | | | | NVS | VS | | |
| Deep Epilimnion | 8.40 | 7.06 | 85.7 | 16 | 1.78 | 2.25 | 1.52 | 6.83 |
| Deep Metalimnion | | | 79.3 | 17 | | | 1.77 | 6.54 |
| Deep Hypolimnion | | | 90.4 | 20 | | | 9.53 | 6.35 |
| Inlet | | | 84.2 | 18 | | | 1.62 | 6.84 |

## HISTORICAL WATER QUALITY TREND ANALYSIS

| Parameter | Trend | Explanation | Parameter | Trend | Explanation |
|---|---|---|---|---|---|
| pH | N/A | Ten consecutive years of data necessary. | Chlorophyll-a | N/A | Ten consecutive years of data necessary. |
| Conductivity | N/A | Ten consecutive years of data necessary. | Transparency | N/A | Ten consecutive years of data necessary. |
| | | | Phosphorus (epilimnion) | N/A | Ten consecutive years of data necessary. |